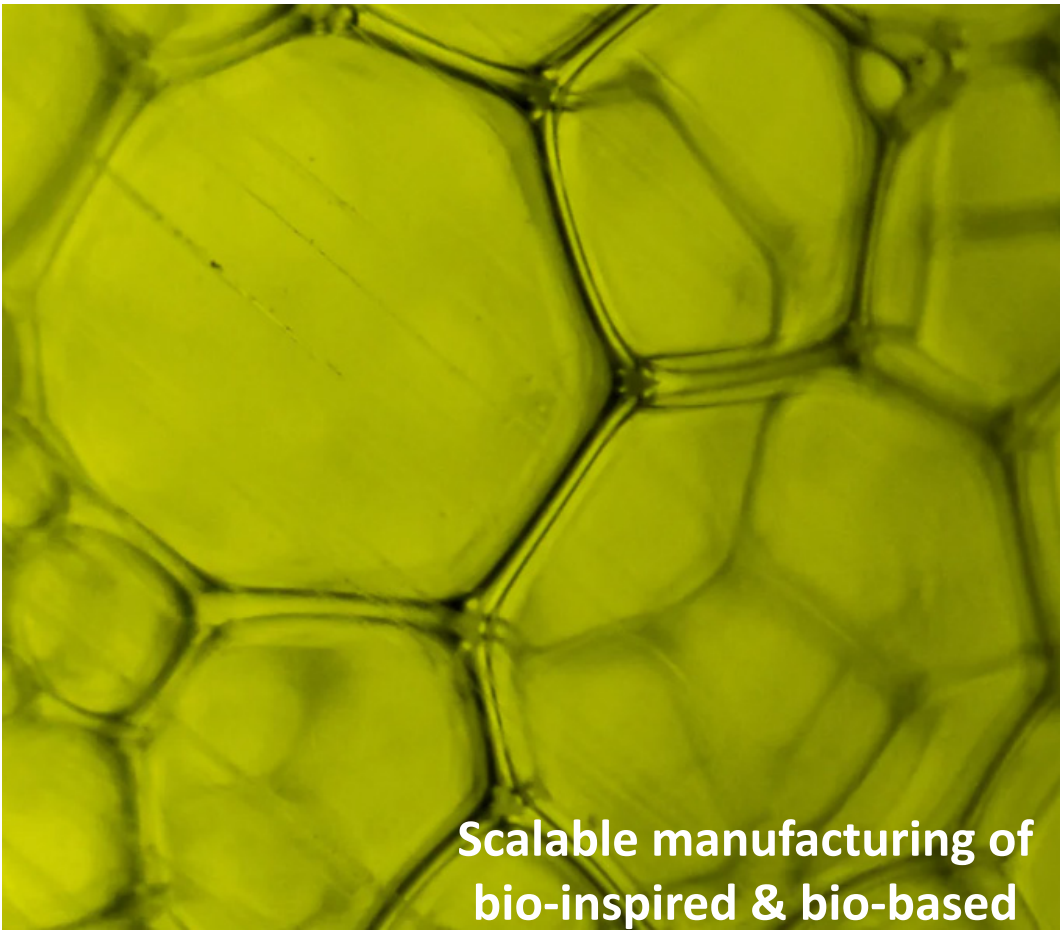

Scalable manufacturing of bio-inspired & bio-based graphene foam components of extreme performance

Bio.3DGREEN

bio3dgreen.eu

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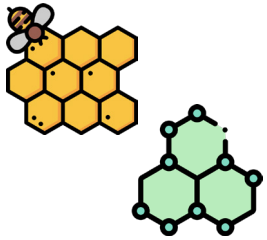
The Project

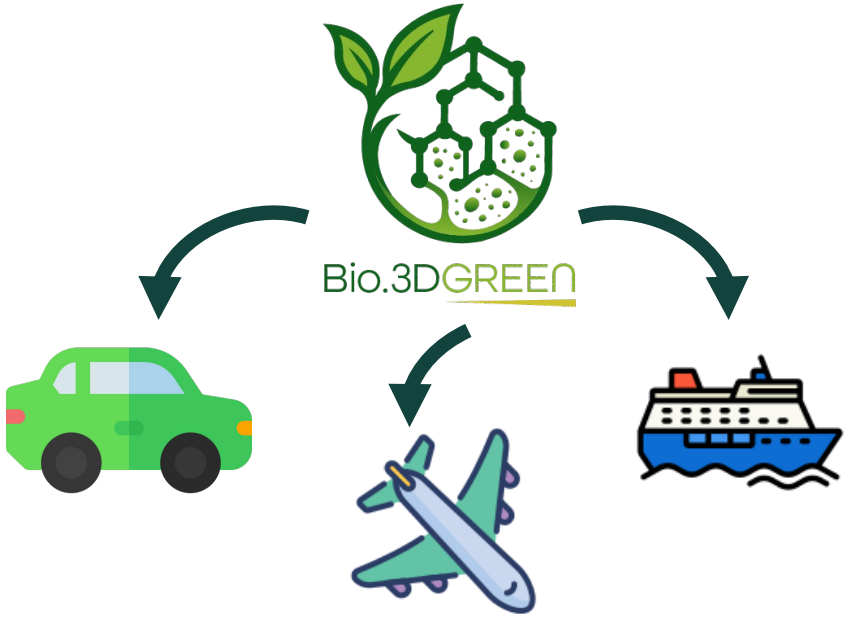
Bio.3DGREEN introduces a novel, nature-based approach towards the design of the next generation of vibration-, noise- and shock-absorbing components from sustainable graphene foam (GF).

By mimicking sponge-like structures found in nature, known for shock absorption and vibration mitigation, Bio.3DGREEN develops and demonstrates a cost-effective, bio-based solution from vegetable oil-derived graphene.



It combines biomimetic engineering and laser-based Additive Manufacturing (AM) to generate durable, lightweight components for applications in automotive, aerospace, and shipping sectors. Inspired by biological structures such as trabecular bone and honeycombs, the manufactured parts exhibit high performance even under extreme environmental conditions.

Use Cases



The Objectives

- Develop bio-inspired graphene foam (GF) to replace fossil-based NVH materials.
- Use renewable vegetable oils for carbon-positive GF production.
- Enable scalable laser-based 3D printing of complex GF structures.
- Demonstrate GF performance in automotive, aerospace, maritime, and construction.
- Enhance durability, lightness, and long-term performance.
- Support circular economy with LCA, LCC, and material recovery.
- Reduce microplastics and environmental impact with safe bio-based solutions.

Our aim is to make advanced graphene technologies more accessible and applicable across industries by:

- Enabling the scalable manufacturing of complex, custom-designed components
- Using carbon-positive, bio-based raw materials such as vegetable oils
- Demonstrating performance in real-world industrial applications
- Supporting the EU's circular economy objectives through recyclability and lifecycle analysis (LCA and LCC).

14 Partners | **9 EU Countries** | **42 Months** | **4.9M Funding**

Contact

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Partners

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